

WHAT IS CLAIMED IS:

1. A chip-like electronic component having at least its electrodes formed exclusively on one surface thereof, and surfaces other than said one surface are continuously
5 covered with a protective material.
2. The chip-like electronic component according to claim 1 wherein said protective material comprises an organic insulating resin or an inorganic insulating
10 material.
3. The chip-like electronic component according to claim 1, comprising a semiconductor chip diced from a wafer at a position of said protective material for
15 mounting on a package substrate, wherein said electrode is formed on said one surface, which is a device surface, of said semiconductor chip, and both a side wall and a bottom surface of said semiconductor chip are covered with said protective material.
- 20 4. The chip-like electronic component according to claim 3 wherein a solder bump is formed on said electrode.
5. The chip-like electronic component according to
25 claim 1 wherein a plurality and/or a plurality of different types of semiconductor chips are integrated as bonded by said protective material.
6. A pseudo wafer comprising a plurality and/or a
30 plurality of different types of chip-like electronic components having at least their electrodes formed solely

on one surface thereof, wherein interspaces between said plurality and/or said plurality of different types of chip-like electronic components and bottom surfaces thereof are continuously covered with said protective material, and bonded with each other.

7. The pseudo wafer according to claim 6 wherein said protective material comprises either one of an organic insulating resin and an inorganic insulating material.

10

8. The pseudo wafer according to claim 6 wherein said plurality and/or said plurality of different types of semiconductor chips arrayed thereon are diced at a position of said protective material between said plurality of semiconductor chips and fabricated into a discrete chip or an integrated semiconductor chip integrating a plurality and/or a plurality of different types of semiconductor chips to be mounted on a packaging substrate.

20

9. The pseudo wafer according to claim 8 wherein a solder bump is formed on said electrode.

10. A method of manufacturing a chip-like electronic component, comprising the steps of:

 pasting an adhesive material on a substrate, said adhesive material having a property to retain an adhesive strength prior to a processing and to lose said adhesive strength after said processing;

fixing a plurality and/or a plurality of different types of semiconductor chips on said adhesive material with an electrode surface thereof facing down;

coating a whole area including said plurality and/or
5 said plurality of different types of semiconductor chips and interspaces therebetween with a protective material;

applying a predetermined process to said adhesive material to weaken said adhesive strength of said adhesive material so as to peel off a pseudo wafer which
10 bonds said plurality and/or said plurality of different types of semiconductor chips as covered with said protective material; and

dicing said plurality and/or said plurality of different types of semiconductor chips by cutting said
15 protective material in said interspaces therebetween thereby obtaining a discrete semiconductor chip or a chip-like electronic component.

11. The method of manufacturing chip-like electronic
20 components according to claim 10, wherein:

said substrate has a flat surface;

said adhesive material is an adhesive sheet;

said plurality and/or said plurality of different types of semiconductor chips are non-defective;

25 said protective material is either one of an organic insulating resin and an inorganic insulating material and is uniformly coated on said plurality of semiconductor chips from a bottom surface thereof to be hardened;

said predetermined process includes irradiating
30 ultraviolet rays on said adhesive sheet through said flat substrate from a bottom surface thereof opposite to the

surface bonding said plurality of semiconductor chips, or applying a chemical solution or heating the same to weaken said adhesive strength of said adhesive sheet so as to peel off a pseudo wafer having said plurality

5 and/or said plurality of different types of semiconductor chips bonded thereon as covered with said protective material, from said flat substrate, thereby obtaining said pseudo wafer, wherein said plurality and/or said plurality of different types of semiconductor chips which
10 are totally non-defective (conforming) are arrayed thereon with their electrode surfaces exposed; and

dicing said pseudo wafer between said plurality and/or said plurality of different types of semiconductor chips.

15

12. The method of manufacturing the chip-like electronic components according to claim 10, wherein:

said pseudo wafer is diced at a position of said protective material between said plurality and/or said
20 plurality of different types of semiconductor chips; and

a discrete semiconductor chip or an integrated chip integrating a plural number and/or a plural different types of semiconductor chips to be mounted on a package substrate are obtained.

25

13. The method of manufacturing the chip-like electronic components according to claim 12, wherein a solder bump is on said electrodes.

30 14. The method of manufacturing the chip-like electronic components according to claim 10, wherein said plurality

of semiconductor chips which are determined to be non-defective in a characteristic measurement thereof are fixed firmly on said substrate.

- 5 15. The method of manufacturing the chip-like electronic components according to claim 10, further comprising the steps of:

carrying out a characteristic measurement of said plurality of semiconductor chips in a state firmly fixed
10 thereon and bonded with said protective material; and
selecting non-defective semiconductor chips or non-defective chip-like electronic components.

16. A method of manufacturing a pseudo wafer comprising
15 the steps of:

pasting an adhesive material on a substrate, said material having a property to retain an adhesive strength prior to a processing and lose said adhesive strength after said processing;

- 20 fixing on said adhesive material a plurality and/or a plurality of different types of semiconductor chips with their electrode surfaces facing down;

coating with a protective material a whole area of said plurality and/or said plurality of different types
25 of semiconductor chips including interspaces therebetween;

applying a predetermined process to said adhesive material so as to lose its adhesive strength; and

- 30 peeling off a pseudo wafer having said plurality and/or said plurality of different types of semiconductor chips fixed thereon.

17. The method of manufacturing said pseudo wafer according to claim 16, wherein:

said substrate has a flat surface;

5 said adhesive material is an adhesive;

said plurality and/or said plurality of different types of semiconductor chips are non-defective;

said protective material is either one of an organic insulating resin and an inorganic insulating material and
10 in uniformly coated on said semiconductor chips from their bottom surfaces to be hardened;

said predetermined process includes irradiating ultraviolet rays, through said substrate, on said adhesive sheet from a bottom surface thereof opposite to
15 the surface thereof fixing said plurality and/or said plurality of different types of semiconductor chips thereon, or applying a chemical solution thereto or heating said adhesive sheet to weaken the adhesive strength of said adhesive sheet so as to peel off a
20 pseudo wafer having said plurality and/or said plurality of different types of semiconductor chips bonded with said protective material from said substrate; and thereby

said pseudo wafer having said plurality and/or said plurality of different types of semiconductor chips which
25 are non-defective, and arrayed thereon, with their electrode surfaces exposed is obtained.

18. The method of manufacturing the pseudo wafer according to claim 16, wherein a solder bump is formed on
30 said electrode.

19. The method of manufacturing the pseudo wafer
according to claim 16, wherein said semiconductor chips
which are determined to be non-defective in
characteristic measurements thereof is fixed on said
5 substrate.

20. The method of manufacturing the pseudo wafer
according to claim 16, further comprising the steps of:
carrying out characteristic measurements of said
10 semiconductor chips in a state as bonded with said
protective material; and
selecting non-defective semiconductor chips or non-
defective chip-like electronic components.